Amendments to the Claims:

The listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (previously presented) A recombinant, purified, or isolated polypeptide comprising an amino acid sequence selected from

(a) the sequence of SEQ ID NO: 1;

(b) amino acids 20 to 235 of SEQ ID NO: 1;

(c) a sequence which has greater than 95% amino acid sequence identity with SEQ ID NO: 1; or

(d) a sequence which has greater than 95% amino acid sequence identity with the sequence of amino acids 20 to 235 of SEQ ID NO: 1.

2. (previously presented) The polypeptide as claimed in claim 1 wherein the amino acid sequence of the polypeptide has greater than 97% amino acid sequence identity with SEQ ID NO:1.

3. (previously presented) The polypeptide as claimed in claim 1 wherein the amino acid sequence of the polypeptide has greater than 99% amino acid sequence identity with SEQ ID NO: 1.

4. (previously presented) The polypeptide as claimed in claim 1 wherein the amino acid sequence of the polypeptide has greater than 99% amino acid sequence identity with the sequence of amino acids 20 to 235 of SEQ ID NO: 1.

5. (previously presented) The polypeptide as claimed in claim 1 wherein the polypeptide consists of an amino acid sequence selected from

(a) the sequence of SEQ ID NO: 1;

(b) amino acids 20 to 235 of SEQ ID NO: 1;

(c) a sequence which has greater than 95% amino acid sequence identity with SEQ ID NO: 1; or

(d) a sequence which has greater than 95% amino acid sequence identity with the sequence of amino acids 20 to 235 of SEQ ID NO: 1.

6. (previously presented) The polypeptide as claimed in claim 1 obtained from a bacterium.

7. (previously presented) The polypeptide as claimed in claim 1 obtained from *Mycobacterium avium* subspecies *paratuberculosis*.

8. (previously presented) The polypeptide as claimed in claim 1 obtained from a heterologous host transformed with a polynucleotide which encodes the polypeptide, wherein said host is capable of expressing said polypeptide.

9. (previously presented) The polypeptide as claimed in claim 8 wherein the host is *E coli*.

10. (previously presented) A genetic construct comprising

(a) a promoter sequence;

(b) an open reading frame polynucleotide encoding a polypeptide as claimed in claim 1; and

(c) a termination sequence.

11. (previously presented) A recombinant, purified, or isolated polynucleotide comprising the sequence of SEQ ID NO: 2 or a variant thereof encoding a polypeptide comprising an amino acid sequence selected from

(a) the sequence of SEQ ID No:1;

(b) amino acids 20 to 235 of SEQ ID NO:1;

(c) a sequence which has greater than 95% amino acid sequence identity with SEQ ID NO:1; or

(d) a sequence which has greater than 95% amino acid sequence identity with the sequence of amino acids 20 to 235 of SEQ ID NO:1.

12. (original) A recombinant, purified or isolated polynucleotide with a nucleotide sequence complementary to the polynucleotide of claim 11.

13. (currently amended) One or more oligonucleotide or polynucleotide primers capable of binding to and amplifying a polynucleotide which encodes a polypeptide consisting of an amino acid sequence selected from (a) the sequence of SEQ ID NO:1 or (b) amino acids 20 to 235 of SEQ ID NO:1~~as claimed in claim 5 in a Polymerase Chain Reaction or other polynucleotide amplification method~~.

14. (currently amended) A purified or isolated antibody capable of binding a polypeptide consisting of an amino acid sequence selected from (a) the sequence of SEQ ID NO:1 or (b) amino acids 20 to 235 of SEQ ID NO:1~~as defined in claim 5~~.

15. (previously presented) A vaccine composition comprising a polypeptide as claimed in claim 1 and an acceptable diluent, carrier, excipient, or adjuvant, said polypeptide being present in an amount sufficient to generate a protective immune response to *Mycobacterium avium* subspecies *paratuberculosis* infection.

16. (previously presented) A diagnostic composition for use in detecting the presence of *Mycobacterium avium* subspecies *paratuberculosis*, wherein said composition comprises a polypeptide as claimed in claim 1 together with one or more acceptable diluents, carriers, excipients, or adjuvants.

17. (previously presented) A diagnostic composition for detecting the presence of *Mycobacterium avium* subspecies *paratuberculosis*, wherein said composition comprises a polynucleotide according to claim 11 together with one or more acceptable diluents, carriers, excipients, or adjuvants.

18. (currently amended) A diagnostic composition for detecting the presence of *Mycobacterium avium* subspecies *paratuberculosis* comprising at least one oligonucleotide or polynucleotide primer capable of amplifying a polynucleotide which encodes a polypeptide ~~as claimed in claim 5~~ in a Polymerase Chain Reaction or other

polynucleotide amplification method, wherein the polypeptide consists of an amino acid sequence selected from (a) the sequence of SEQ ID NO:1 or (b) amino acids 20 to 235 of SEQ ID NO:1.

19. (previously presented) A diagnostic composition for detecting the presence of *Mycobacterium avium* subspecies *paratuberculosis* comprising an antibody according to claim 14 together with one or more acceptable diluents, carriers, excipients, or adjuvants.

20. (currently amended) A method of detecting Johne's disease including preclinical Johne's disease in an animal comprising contacting either the animal or a sample from the animal with a polypeptide ~~as claimed in claim 5~~ and detecting an immune response indicative of the presence of *Mycobacterium avium* subspecies *paratuberculosis*, the polypeptide consists of an amino acid sequence selected from (a) the sequence of SEQ ID NO:1 or (b) amino acids 20 to 235 of SEQ ID NO:1.

21. (previously presented) The method according to claim 20 wherein the response is a delayed-type hypersensitivity response.

22. (currently amended) The method according to claim 20 wherein said detecting comprises detecting the presence of antibodies that bind the polypeptide ~~as claimed in claim 5~~.

23. (previously presented) The method according to claim 22 wherein the detection of the presence of antibodies is by ELISA, radioimmunoassay or Western blotting.

24. (currently amended) A method of detecting Johne's disease including preclinical Johne's disease in an animal, the method comprising contacting a sample from the animal either with a purified or isolated antibody capable of binding a polypeptide consisting of an amino acid sequence selected from
(a) the sequence of SEQ ID NO:1 or
(b) amino acids 20 to 235 of SEQ ID NO:1 or
with a composition comprising an antibody specific to a polypeptide consisting of an amino acid sequence selected from
(a) the sequence of SEQ ID NO:1 or
(b) amino acids 20 to 235 of SEQ ID NO:1~~as claimed in claim 5~~,

and one or more acceptable diluents, carriers, excipients, or adjuvants, and detecting a polypeptide which binds to the antibody.

25. (previously presented) The method according to claim 24 wherein the presence of bound antibody is determined by ELISA, radioimmunoassay or Western blotting.

26. (previously presented) The method according to claim 24 for detecting the presence of *Mycobacterium avium* subspecies *paratuberculosis* at a preclinical phase of Johne's disease.

27. (currently amended) A method of detecting Johne's disease including preclinical Johne's disease in an animal comprising contacting a sample from the animal with a composition comprising at least one oligonucleotide or polynucleotide primers capable of binding to and amplifying a polynucleotide which encodes a polypeptide consisting of an amino acid sequence selected from (a) the sequence of SEQ ID NO:1 or (b) amino acids 20 to 235 of SEQ ID NO:1 ~~as claimed in claim 4~~ in a polynucleotide amplification method and detecting the amplification product.

28. (previously presented) The method as claimed in claim 27 wherein the polynucleotide amplification method is a polymerase chain reaction method.

29. (previously presented) The method according to claim 27 for detecting the presence of *Mycobacterium avium* subspecies *paratuberculosis* at a preclinical phase of Johne's disease.

30. (currently amended) A method of detecting Johne's disease in an animal comprising contacting a sample from the animal with a composition comprising a polynucleotide capable of binding to a polynucleotide which encodes a polypeptide consisting of an amino acid sequence selected from (a) the sequence of SEQ ID NO:1 or (b) amino acids 20 to 235 of SEQ ID NO:1~~as claimed in claim 5~~.

31. (previously presented) The method according to claim 30 wherein said polynucleotide is detectably labeled.

32. (previously presented) The method according to claim 31 wherein said detectable label is a radioisotope or fluorescent tag.

33. (previously presented) A method of prophylactically or therapeutically treating an animal against Johne's disease which comprises administering to an animal a polypeptide as claimed in claim 1 to produce a protective immunological response in the animal.

34. (previously presented) The method according to claim 33 which is a therapeutic method.

35. (previously presented) The method according to claim 33 which is a prophylactic method.

36. (original) A method of vaccinating against Johne's disease which comprises administering to an animal a vaccine composition as claimed in claim 15 in an amount sufficient to produce a protective response.

37. (previously presented) The method according to claim 36 wherein said administration is performed on a single occasion.

38. (previously presented) The method according to claim 36 wherein said administration is performed on more than one occasion.

39. (previously presented) The method as claimed in claim 36 wherein 0.1-1000μg/Kg is administered of a recombinant, purified, or isolated polypeptide comprising an amino acid sequence selected from

(a) the sequence of SEQ ID NO: 1;

(b) amino acids 20 to 235 of SEQ ID NO:1;

(c) a sequence which has greater than 95% amino acid sequence identity with SEQ ID NO:1; or

(d) a sequence which has greater than 95% amino acid sequence identity with the sequence of amino acids 20 to 235 of SEQ ID NO:1.

40. (previously presented) The method as claimed in claim 39 wherein 5-500μg/Kg of the polypeptide is administered.

41. (currently amended) A kit for use in detecting the presence of *Mycobacterium avium* subspecies *paratuberculosis* comprising at least two of the following:

a polypeptide as claimed in claim 5;

an antibody that binds a ~~said~~ polypeptide consisting of an amino acid sequence selected from (a) the sequence of SEQ ID NO:1 or (b) amino acids 20 to 235 of SEQ ID NO:1; or

a reagent for determining antigen-antibody binding.

42. (previously presented) A host cell transformed with a polynucleotide of claim 11.

43. (original) A vector comprising the construct as claimed in claim 10.

44. (original) A host cell incorporating a construct of claim 10.

45. (original) A host cell incorporating a vector as claimed in claim 43.

46. (previously presented) The host cell according to claim 45 wherein said vector exists within the host cell as a plasmid.

47. (previously presented) The host cell according to claim 45 wherein said vector is integrated into the genome of the host cell.

48. (previously presented) The method as claimed in claim 20 wherein the animal is a ruminant.

49. (previously presented) The method as claimed in claim 48 wherein the animal is a sheep.

50. (previously presented) The method as claimed in claim 33 wherein the animal is a ruminant.

51. (previously presented) The method as claimed in claim 50 wherein the ruminant is a sheep.

52. (cancelled)